

Tracking Gold Nanoparticles in the Circulatory System

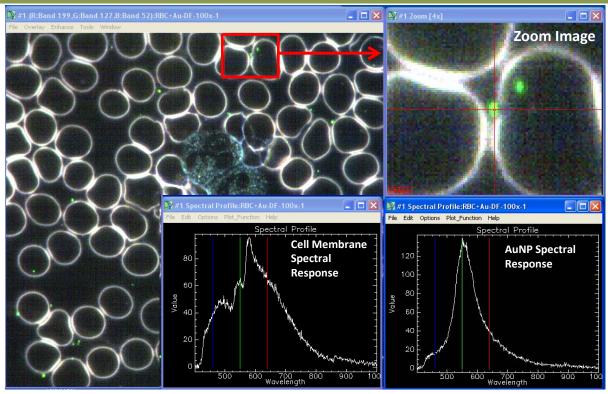


Figure 1. 50nm AuNP (green) in whole blood sample, illustrating AuNP and blood cell spectral signatures.

A wide range of nanoparticle constructs are currently in development for use as targeted drug delivery vectors. Some of these nanoparticle systems are now in clinical trials and hold great promise to enhance the efficacy of a wide range of drugs, including cancer chemotherapies.

Currently ,gold nanoparticles (AuNPs) appear to be the most widely utilized nanoparticles for drug delivery applications, as they possess many advantageous properties, including their inert nature. AuNPs also have significant surface areas which make them advantageous for functionalization with conjugation proteins and drug chemistry.

As the circulatory system is the vehicle for delivery of functionalized nanoparticles, it is critical that these particles are tracked during their journey in the bloodstream. The CytoViva Hyperspectral Microscope is a highly effective tool for observing and characterizing AuNPs and other nanoparticles in the bloodstream.

CytoViva's patented, enhanced darkfield microscope capability creates a high signal to noise optical image, which enables direct observation of unlabeled AuNPs when present in blood. In Figure 1 above, the AuNPs appear green due to the effect of their plasmon resonance when illuminated with full spectrum visible light. Additionally, these particles produce a distinct reflectance spectral response, which enables spectral characterization and mapping of the particles in the blood sample. As you can see from Figure 1, the spectral response of a AuNP varies significantly from the blood cell membrane spectra.

Using CytoViva technology, scientists can quickly and easily track nanoparticles in the circulatory system to better understand their effectiveness as drug delivery vectors.